

津山 尚*・杉野孝雄**：日本産オニノヤガラ属雑記 (3)***

Takasi TUYAMA & Takao SUGINO: Notes on *Gastrodia* of Japan (3)

4) *Gastrodia gracilis* Bl. の生植物の発見について

Gastrodia gracilis Blume is truly a very rare orchid of Japan, and has long been expected by us to be discovered by the Japanese botanist at its living habitat. This was first collected by an unknown collector somewhere in Japan in the middle of the nineteenth century, and sent to Leiden for identification by C. J. Textor, the famous trademan in the early history of Dutch-Japanese relationships. This plant was named by Blume as a new species, *Gastrodia gracilis* in Mus. Bot. Lugd.-Bat. (1856) and Orchid. Arch. Ind. Jap. (1858). Thereafter, this name appeared many times in the literatures such as Miquel in Ann. Mus. Bot. Lugd.-Bat. vol. 2 (1865), Franchet et Savatier, Enum. Pl. Jap. vol. 2 (1876), and Schlechter, Prodr. Orchid. Sino-Japon. (1919), with no additional specimen or locality. Actually no plant belonging to this species had been discovered until the rediscovery of dried specimen was made by Tuyama in 1951. Yet, the living flower of this plant has never been observed by any botanist up to the last year.

Concerning this plant, Schlechter states as follows: "Eine viel smächtiger und Schlankere Pflanze und offendar sehr viel seltner als *G. elata* Bl.....dadurch sehr gut unterscheiden, das anders geformte Labellum am Grunde zwei runde Schwielen oder Auswüchse trägt, die für eine ganze Reihe von der Gattung charakteristisch sind." However, Tuyama is not quite sure whether Schlechter himself examined the type specimen at Leiden or not. At that time no extant specimen belonged to *G. gracilis* was known except the type, so that it is very probable that he made the above mentioned words based on the very young flower attached to the type specimen, or only quated from the descriptions of the previous authors.

Unfortunately, Makino applied this name erroneously to the depauperated form of *Gastrodia elata* Bl. several times in his papers as pointed out by Tuyama in 1952. This essentially caused misapplication of the name among the Japanese botanists thereafter, and resulted to let them overlook the true *G. gracilis* in the flora of Japan.

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*** Contined from Journ. Jap. Bot. 31: 77-82 (1956).



Figs. 1-3. *Gastrodia gracilis* Blume. left two. Plants in flowers at their natural habitats, Sakashita, Kakegawa-city, Shizuoka Pref., June 27, 1965. above \times ca. 1/3. below \times ca. 4/5. 3. right. Plants in fruit at the same place, Jul. 10, 1966. \times ca. 2/5. (Photo. by Sugino)

In 1951, when many botanists at Tokyo were engaging in the project to specify a large number of unmounted specimens then deposited in the late Dr. Makino's private herbarium, Tuyama had chanced to find out very strange orchid which later proved to be true *G. gracilis*. Again in 1956, Tuyama found out the



Fig. 4. Hitherto known distribution of *Gastrodia gracilis* Bl., except one vague locality, "southern part of Kyushu." An arrow denotes the spot where the plants were first found out by Sugino at their natural habitat.

same plants in the herbarium of Kyoto University. The localities of this plants hitherto known are as follows. Prov. Awa, Mt. Kiyosumi (leg. H. Ogawa, Jun. 11, 1932); Prov. Aki, Nabara-kyo (leg.? T. Makino, Jul. 1934); Prov. Hyuga, Mt. Wanizuka (leg. ?, anno ?); Kyusyu, southern part, no definite locality (leg. ? Z. Tashiro, anno?). These specimens are all in bad conditions, only accompanying young or almost mature fruits and decayed flowers. In addition to these in many instances these are partly insect-bitten. On examination of these specimens all through, the important systematic characters of *G. gracilis* Bl. that match well with the diagnosis of Blume's were found by Tuyama; that is 1) small and obtuse bract, 2) long and delicate pedicel, and 3) nodding and ventricose corolla. 4) Elongation of the pedicels after the anthesis, and 5) emitting out of filiform stolons from the neck of the mother tuber were the new additions to the diagnosis of the plant.

Prof. Hara of University of Tokyo has kindly examined the type specimen at Rijksherbarium, Leiden in 1954, and confirmed that the specimens mentioned above has no discrepancies with the type specimen. In 1963, Tuyama also visited the herbarium and reconfirmed the fact himself. Afterwards, Prof. van Steenis of that herbarium has kindly sent the photograph of the type specimen to Tuyama. The type specimen is rather a smaller plant lacking underground tuber with only

three flowers attached to the scape. Another flower was discovered in a small paper bag attached to the type sheet. This has six bracts as a whole on the scape, so that it may be presumed that the plant had originally six flowers. On the label of the type sheet, a handwriting reads as follows; '*Gastrodia gracilis* Bl. Textor "*Gastrodia humilis*".

Finally, the long-expected plant was discovered by the junior author, Sugino last year living at Sakashita, Kakegawa-City, Shizuoka Prefecture. The flowers were almost alike as Tuyama has already expected to be in his previous papers (Journ. Jap. Bot. **27**: 19—26, f. 1, 1952; et l. c. **31**: 77—82, f. 1—3, 1956).

The vegetation of the habitat Sugino has discovered is wholly included in the ground of a shrine, where several stands of *Cryptomeria japonica* and a cinnamon tree are found. Other than these trees *Quercus glauca* is dominating with occasional addition of *Prunus spinulosa*. As the undergrowth, *Mitchella undulata*, *Pollia japonica*, *Ardisia japonica*, *A. pusilla*, *Trachelospermum asiaticum*, and *Oplismenus undulatifolius* var. *japonicus* are growing mixed rather rarely with casual *Dryopteris varia* (taking the form of *D. Ogawae*). Under these circumstances, *Gastrodia gracilis* is growing scatteredly on the soil covered with the thick humus between the fallen and dead branchlets of mainly *Cryptomeria japonica*. Accordingly, the plants are living in the shady place where only a very little sunbeam comes down on the surface of the ground.

The following is the revised description of *Gastrodia gracilis* consulting all the specimens hitherto known and new data collected by Sugino from 24 individuals at their newly discovered natural habitat. The description is made in the form included in Ohwi's Flora of Japan in English p. 338 (1965), for his description is mainly based on Tuyama's Japanese description published in Journ. Jap. Bot. **31**: 81.

Saprophytic. Rhizomes pilosulate or very rarely glabrescent commonly with obsolete scales, 3.0 to more than 11.0 cm. long, 0.3 to 0.9 cm thick. Stems erect and slender 10.5 to 61 cm long, with 4–9 loosely arranged, membranaceous basal sheaths; racemes rather short 0.5–3.7 cm long rather congestedly 3–11-, rarely more than 20-flowered; flowers nodding horizontally or somewhat drooping, campanulate, pale brownish, about 10 mm long excluding the ovary, bracts much shorter than the pedicels, ovate or elliptic ovate, obtuse, 2.0–4.0 mm long; pedicels slender longer than the ovary 3.0–5.5 mm long, filiform 5–15 mm long 0.3 to 0.5 mm thick, the lowest is longest and thickest rapidly elongate and thickened after the flower, attaining to 1.1–2.3 cm long and 0.5–1.0 mm thick in the mature fruits; tube of the

sepals slightly inflated at the base on the lower side and trifid at the mouth, the sinus on the lower side deepest, attaining to $1/4-1/3$ of the total length of the tube; the sepals nearly equal, very obtuse, a little undulating irregularly on the margin, and apiculated at the apex, 3-nerved; nerves branching very little upwards, from the tip of the sepals for a short distance along the midvein on the dorsal side a little verruculose; petals, very small, attached on the subapical part of the sepal tube. In some instances, the sepals make the tube completely by themselves, and in other instances the tube is formed by the intervening portion of the basal part of petals. Petals small ovate slightly unequal curving downwards, margins undulating; lips about 6 mm long excluding the hypochile, broadly ovate with cuspidate and obtuse tips,

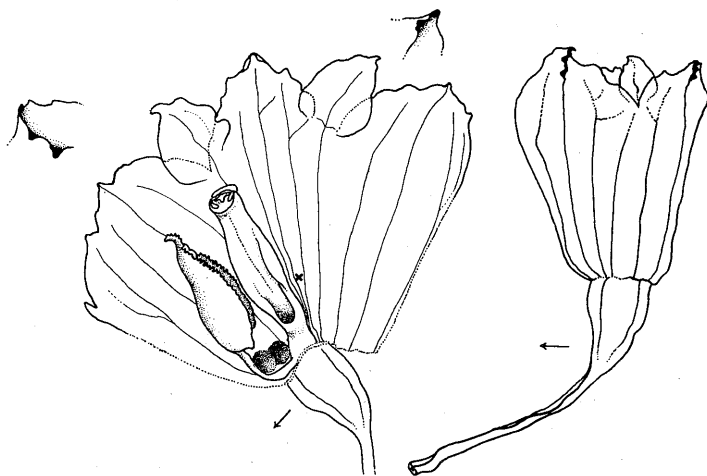


Fig. 5. *Gastrodia gracilis* Blume.

Left. Expanded corolla showing column and lip, with petals attached to the tube of sepals. The dotted lines on both sides of expanded corolla denote the artificially cut edges. \times ca. 3.5. Around the mark \times , the corolla is somewhat folded. Two tips of the sepals show the dorsal views with the verrucae on their backs. \times ca. 7..

Right. Surface view of nodding corolla with an ovary and a pedicle \times ca. 3.0. Arrows show the vertical lines in their natural positions. All figures are drawn by Tuyama from the boiled specimens collected by Sugino.

epichile strongly and minutely undulating up and down on the whole margins especially strongly midway, with 2 prominent lamellae down the apex running downwards and diminishing, 5-nerved, hypochile linear slightly incurved, down the middle part on both sides with globular, verrucose calli of 0.8 mm in diameter. Column straight narrowly winged anterior both sides, with the depression (stigma)

of U-shape near the base. Ovaries turbinate 3 mm long, base attenuated. Capsules broadly ellipsoidal about 1.5 cm long and 0.5 cm thick when pressed.

According to Sugino's observations, the stalk of flower is so fragile, that even by a soft touch it may easily be broken, and this tendency is stronger when in bud. The plants, in their natural habitat, are commonly growing in groups of 3-5 individuals or solitarily. They are in full blossom between 27th and 29th of June, and the capsules are observed to be mature completely on 10th of July already liberating the fine seeds. After the flower, several filiform stolons come out from near the top of the mother tuber. This facts accord well with what was described by H. Burgeff on the other species of the genus in his 'Saprophytismus und Symbiose', 1932.

Newly collected specimens by Sugino: Sakashita, Kakegawa-City, Shizuoka Pref. (12, Jun. 1965, scapes with not fully developed raceme); 1. c. (Jun. 27, 1965, with flowers or large buds); 1. c. (Jun. 26, 1964, with premature fruits); 1. c. (Jul. 10, 1966, with mature fruits).

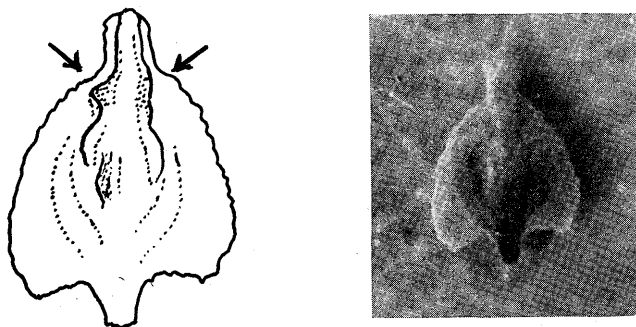


Fig. 6. Right. Microscopic photograph of the lip. A ventral view. \times ca. 4.0. The arrows show the foldings of the lamellae on the innermost side-veins. From the boiled specimen. Photographed by Mr. T. Yamashita. Left. The same, sketched by Tuyama. \times ca. 6.

Adnote: Sugino was recently informed that already in 1962 Mr. Sadamu Okuchi of Kakegawa Higher Middle School collected this plant with fruits at the same spot. The specimen was mistaken as *Lecanorchis* sp., before the Sugino's collections.

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ナヨテンマ *Gastrodia gracilis* Bl. を著者の一人、津山が旧牧野腊葉館（東京都大泉）で発見し、またこれを京大の標本室で追加発見したことは、本誌 27: 19-26 (1952) および 31: 77-82 (1956) に報告したが、実際に生育している植物は Textor が 1800 年代の中葉に、これを日本からオランダに送って以来、約 100 年間、再び発見されるこ

とはなかった。ところが昨年(1965 年) 6 月下旬に著者の一人、杉野が静岡県掛川市坂下で多数の群落を発見し、蕾の状態から開花まで、また急速に 7 月上旬には結実する状態を観察したので、ここに報告する。杉野は今年も同所で、24 個体について詳細に、植物体の各部について計測したが、これについては杉野が後で報告することとし、とりあえず、今まで得られた地点の乾燥標本 (Fig. 4 参照) からのデータと合せて、この植物の記相文を發表する。花の色は杉野によると淡褐色である。既知の分布地点から見て、この植物は広く日本の中西部の南岸に沿う暖地に生育しているらしいから、今後の続く発見が期待できる。それは丁度 *Gastrodia nipponica* Honda et Tuyama ハルザキヤツシロラン、*G. confusa* Tuyama アキザキヤツシロランが日本国内に案外広く分布していることが近年分った例に似たものとなるであろう。この植物が樹下の暗い腐葉土の中に生じ、色も褐色で見立たぬ上に、生育期間が極めて短いことは発見を極めて困難にしているようである。いずれにしても、今回発見の現場は大切に保存さるべきであり、学術に無縁の人々の攪乱は勿論、学術の保護の名を借りてであろう如何なる現場の変更も許さるべきではない。

本属の植物は今まで世界に 38 種の報告があり、アフリカ、マダガスカルの各 1 種には所属に疑問があるので、これを除くと、日本、中国、インド、セイロン、ビルマ、タイ、ニューギニアを含むマレー群島、オーストラリア、ニューカレドニア、ニュージーランドに 36 種が分布することになる。その中、*G. dioscoreirhiza* Hayata (台湾)、*G. taiwaniana* Fukuy. (台湾)、は *G. gracilis* とまず同種であると思われる。また Holttum 氏によると *G. malayana* Ridl. (マレー半島) は *G. javaica* の異名となるというし、また *G. Mairei* Schltr. (中国西部) は *G. elata* Bl. オニノヤガラと同種であると見ている。また *G. foetida* Koidzumi (琉球) フユザキヤツシロランは *G. nipponica* と同種かまた至近の種であるので、今の所確實には 31 種が上記の分布圏にあることになる。大洋州産のものはかつて Kew から標本を借りて調べた。

Gastrodia を花の終わった後に花柄が全く伸長しないもの (A)、少し (2 cm 位まで) 伸びるもの (B)、長く伸びる (30 cm 位まで) もの (C)、に分けると、A 群には、*G. eleta* Bl. (沿海州、日本、台湾、中国西部)、*G. sesamoides* Benth. et Hook. f. (ヒマラヤ)、*G. Dyeriana* King et Pantl. (ヒマラヤ) およびオーストラリア、ニュージーランド、ニューカレドニアの約 8 種がこれに属し、*G. taiensis* Tuyama (ラオス、チャパ高原、早田教授採)、*G. Hayatae* Tuyama (タイ、ドイスステーブ、早田教授採) もこれに属するものと思われる。B 群に属するのが *G. gracilis* Bl. ナヨテンマで日本から台湾におよぶものと思われる。この群に入るものはより南方にも分布していると信ぜられる。C 群には *G. nipponica*、*G. confusa* (以上日本内地、琉球)、*G. boninensis* Tuyama (小笠原島)、*G. Holttumii* Carr. (マレー半島)、*G. callosa* J. J. Sm., *G. abscondita* J. J. Sm., *G. crispa* J. J. Sm. (以上ジャワ)、*G. celebica* Schltr. (セレベス)、*G.*

verrucosa Bl. (スマトラ), *G. grandilabris* Carr. (ボルネオ) *G. papuana* Schltr. (ニューギニア) などである。他のものは標本が不完全で果実の状態は不明である。牧野博士の *G. shikokiana* は周知のように *Hetaeria shikokiana* (Makino) Tuyama で、*Hetaeria* 中の数少ない腐生種である。*Gastrodia* で B 群のものはまだ、台湾、フィリピンで発見されていないが、不完全な標本を見たことがあるから、将来の報告を待ちたい。上記の英文にはここに述べた属内の分布論を除き、*G. gracilis* Bl. の研究史、最も正確と信ずる記相文、および今回発見された現場の生態環境の概略について述べた。

追記：本原稿をまとめた後に、杉野が採集したのと同じ場所で 1962 年にこの植物を採集した人があることが判った。その時の標本は果実のあるもので *Lecanorchis* sp. ムヨウラン属の 1 種とされていたようである。各地でもこのような誤認も一因となって、*Gastrodia gracilis* の発見がおくれているのではないかと想像する。

□Spore, K. R: **The morphology of Gymnosperms:** The structure and evolution of primitive seed-plants. Hutchinson University Library, London pp. 216 (1965). 15s ¥900. 著者はかつて、シダ植物の類以の好著があり、そこに盛られたさびきびした整頓と紹介が本書でも骨子となっている。はじめに短かい総論を述べ、ついで Engler の Syllabus (1954) 上巻の分類の順に従って各群を説明する。多くのデータがよく消化されて記述されており、文献もかなり最近のものまでひろってあってよい参考書である。行文もやさしく読んで面白いのは、著者の腕前というものだろう。終りに Syllabus に従ったとはいうものの、著者の見解で改変がされているから、そのシステムを抄出しておこう。

裸子植物（これは自然群ではないとする）。

A. Cycadopsida ソテツ綱 1. Pteridospermales. Caytoniales をつづして加え 7 科とする。Plumstead の *Glusiopteris* 顕花植物起源説は時機尚早という。Bennettitales. 2 科 3. Pentoxylales. 1 科。(Mecuse の単子葉類起源説に触れず)。4. Cycadales. ソテツ目。ここに Nilssoniales をつづして加え 2 科とする。

B. Coniferopsida 針葉樹綱 1. Cordaitales. 3 科 (前川の葉類論に触れず)。2. Coniferales. 針葉樹目。9 科。3. Taxales イチイ目, 1 科 (Taxopsida の扱いをやめたのは適正と思う)。4. Ginkgoales イチヨウ目 1 科 (抄録者は Syllabus で Cycadopsida にこれが入っていたのは卓見と思っているが、著者は Florin につられてここへ入れてしまったのは恐らく改悪の部であろう)。

C. Gnetopsida グネツム綱. Gnetales グネツム目 3 科, 従前通り, 終りにこの頃裸子植物の二元説が勢があるのに対して, Beck の Progymnospermopsida を持ち出し